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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,492	02/03/2005	Andrew E. Feiring	SR0020USPCT	1866

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EXAMINER

HU, HENRY S

ART UNIT	PAPER NUMBER
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1713

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/523,492

Applicant(s)

FEIRING ET AL.

Examiner

Henry S. Hu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Election of October 27, 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. It is noted that Applicants' **IDS** (2 pages) filed on May 20, 2005 was received. It is also noted that this US Application is from **PCT/US03/25023** filed on August 8, 2003. This Office Action is in response to **Election** filed on October 27, 2006. **With cancellation of two non-elected Groups II-III (Claims 15-36), Applicant's election of Group I (Claims 1-14) is traversed with remarks on page 6.** The traversal is on the ground(s) that it would not place an undue burden to search and examine two non-elected Groups II-III (Claims 15-36) with the elected Group I since all three groups are both novel and non-obvious so that they share a special technical feature and thereby a separated examination is not necessary. This is not found persuasive because each group is drawn to a technology apparently requiring search in different classification area. In the instant case, Group I was drawn to **a fluorine-containing copolymer**, Group II was drawn to **a photoresist composition**, while Group III was drawn to **a coated substrate**.

2. As discussed earlier, even the fluorinated copolymer (Group I) is indeed containing in each of Group II and Group III as a major component; each group still has different scope, process of making and process of using. Group III's substrate using a photoresist composition (Group II) is unique and thereby not interchangeable. Therefore, the scope of the claims, i.e., the metes and boundaries are distinct.

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The requirement is still deemed proper and is therefore made FINAL. **Claims 1-14 with one independent claim (Claim 1) are now pending** since two non-elected Groups II-III (Claims 15-36) are both cancelled. An action follows.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. The limitation of parent **Claim 1** in present invention relates to a fluorine~containing copolymer comprising two monomer units including: (A) a repeat unit derived from an ethylenically unsaturated compound having at least one fluorine atom covalently attached to an ethylenically unsaturated carbon atom; and (B) at least a repeat unit derived from an

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ethylenically unsaturated cyclic compound of structure (I) with a four-membered ring and all factors are specified as: (a) n is 0, 1, or 2; and (b) R¹, R2, R3 and R4 are independently from: (b1) H; (b2) C₁₋₁₀ alkyl or alkoxy, optionally substituted by halogen or ether oxygens; or (b3) C₆₋₂₀ aryl. See other limitations of dependent Claims 2-14.

5. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobo et al. (US 5,229,473) in view of Brasen (US 2,928,865).

Regarding parent **Claim 1**, instant polymer relates to a fluorinated copolymer comprising two repeating units from: (A) at least one fluoroolefin having at least one fluorine atom attaching to double bond and (B) at least one **polycyclic olefin** having a formula of (I) containing **a four-membered ring**. **Kobo et al.** have disclosed a method for the production of two fluorine-containing copolymers (A) and (B).

6. **Copolymer (A) is a dipolymer** (column 1, line 65 – column 2, line 31) comprising two monomers as: (a) at least one fluoroolefin and (b) at least one cyclic unsaturated compound selected from formulas (I) or (II), wherein formula (II) is structurally reading on the claimed structure including all the limitations on the five factors of n, R¹, R2, R3 and R4 except the outer ring size is five or more since Kobo's "factor of I" is an integer of 3 or more (abstract, line 1-30; column 1, line 65 – column 2, line 67; particularly see the "factor of I" at column 2, line 27-28). The size of outer alicyclic ring used by Kobo is five or six (see structures on columns 3-5).

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Copolymer (B) is a terpolymer and is related to compolymer (A) with additional monomer such as at least one from mono- and diolefin (column 2, line 32-36). It is noted that open language "comprising" is applied in parent Claim 1 for monomer composition. Therefore, the scope of instant polymer certainly includes dipolymer (A) and terpolymer (B).

7. Therefore, **Kobo is only silent about the outer alicyclic ring size being four, Brasen** teaches that polycyclic alkenes having three or four fused rings and its outer alicyclic ring being **a four-membered ring** can be readily prepared (column 1, line 36-44; column 2, line 21-70; column 9, line 19-28 and 46-54). By doing so, the advantage is that the unsaturated double bond in the alkene can be copolymerized with other fluoroolefin such as **tetrafluoroethylene** so as to obtain many unique properties (column 1, line 27-34; also see example 1 at column 4, line 64). In light of the fact that both involving references are dealing with polycyclic monomeric compounds having outer alicyclic ring for copolymerization with fluorinated olefin, one having ordinary skill in the art would therefore have found it obvious to modify and/or extend the preparation of Kobo's monomer having formula (II) to carry a four-membered outer ring as taught by Brasen. By doing so, it still can be copolymerized with fluoroolefin such as tetrafluoroethylene. Additionally, many unique properties from such obtained copolymers may be obtained due to such a modification or extension.

8. Remaining dependent **Claims 2-4** are thereby rejected with the same reason for the above rejection of parent Claim 1.

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9. Claims 5-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobo et al. (US 5,229,473 A) in view of Brasen (US 2,928,865) as applied to Claims 1-4, and further in view of Wheland et al. (US 2003/0215735 A1).

The above discussion of the disclosures of the prior art of Kobo for Claims 1-4 of this office action is incorporated here by reference. Regarding dependent **Claims 5-14**, **Kobo/Brasen is silent about two things as: (A) further comprising a polar group such as a fluoroalcohol group and/or a protected fluoroalcohol groups (for Claims 5-8 and 14) and (B) further comprising one acid-containing or protected acid-containing structure unit of $(-\text{CH}_2-\text{C}(\text{E}_1)(\text{E}_2)-)$ such as tertiary-butyl acrylate (for Claims 9-13).**

On one hand, **Wheland et al. have taught limitation (A) for Claims 5-8 and 14** by attaching a fluorinated alcoholic group such as $-\text{C}(\text{R}_f)(\text{R}_f)-\text{OH}$ (which is treated as an acid as known in the art) and the like as well as its protected substituents onto the monomer (paragraphs 0063-0067 and 0079).

On the other hand, **Wheland et al. have taught limitation (B) for Claims 9-13** by adding additional monomer which is acid-containing or protected acid-containing for copolymerization use. For instance, tertiary-alkyl acrylates or tertiary-alkyl methacrylates can be included (paragraph 0068). By doing so, photoacid group can be generated for catalysis upon imagewise exposure for resist formation (paragraphs 0063-0064; also see abstract, line 1-12; paragraphs 0003-0008).

10. Therefore, the skill artisan would make the obvious connection to further add the claimed fluoroalcohol or protected fluoroalcohol groups on somewhere in the cyclic alkenes as well as to add acid-containing or protected acid-containing monomer such as tertiary-alkyl acrylates or tertiary-alkyl methacrylates for copolymerization so as to prepare the claimed copolymers useful as a photoresist. By doing so, photoacid group can be readily and conveniently generated in situ for catalysis upon imagewise exposure

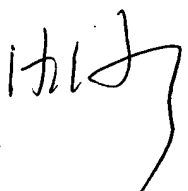
Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to a fluorinated copolymer comprising two monomer units including: (A) an ethylenically unsaturated compound having at least one fluorine atom covalently attached to an ethylenically unsaturated carbon atom; and (B) a repeat unit derived from an ethylenically unsaturated cyclic compound as specified in formula (1): **EP 1,246,013 A2 to Feiring et al.** only discloses a process for the formation of photoresist by using a fluorinated copolymer having polycyclic rings (abstract, line 1-18; paragraphs 0010-0012). Although the ring structure having outer alicyclic ring of four on page 5 at line 1-15 is reading on the claimed formula (I), it still does not carry the claimed limitation on R^1 , R_2 , R_3 and R_4 . Although the ring structure on page 10 at line 20-30 is "almost" reading on the claimed formula (I), it still does not carry the claimed outer ring size of four since the factor of p is an integer of three or more (page 10, line 57). Therefore, Feiring fails to teach or fairly

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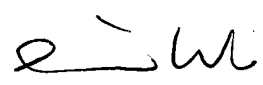
suggest the process of present invention. It is noted that such an EP patent carries a later publication date of **October 2, 2002** in comparing with a priority date of August 9, 2002 for instant Application.

12. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu** whose telephone number is (571) 272-1103. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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Patent Examiner, Art Unit 1713, USPTO

January 20, 2007


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